

Activated carbon supported cobalt based catalyst for direct conversion of
5 synthesis gas to diesel fuels

Abstract

10 Diesel fuels or blending stocks having high cetane number are produced
from non-shifting Fischer-Tropsch processes, which directly convert carbon
monoxide and hydrogen to diesel distillates over activated carbon supported
cobalt based Fischer-Tropsch catalysts. The activated carbon supported cobalt
based catalysts comprise a substantially high dispersion of at least one of a
15 zirconium component, an cerium component, a ruthenium component or a
potassium component in porous carbon and elemental cobalt either deposited
thereon or substantially uniformly dispersed therein, wherein the concentration of
activated carbon in the catalyst is from about 20 to about 90 percent by weight,
based on the weight of the catalyst, the concentration of elemental cobalt in the
catalyst is from about 4 to about 50 percent by weight, based on the weight of the
20 catalyst, the total concentration of the zirconium component, the cerium
component, or a combination thereof in the catalyst is from about 0.01 to about 20
percent by weight, based on the weight of the catalyst and calculated as the
elemental metal or metals, and the total concentration of the ruthenium
component, the potassium component, or a combination thereof in the catalyst is
25 from about 0.01 to about 5.0 percent by weight, based on the weight of the
catalyst and calculated as the elemental metal or metals. Activated carbon carrier
has a surface area in the range of about 200-2000 m² /g, preferably 800-1500 m²
/g, and a pore volume of 0.3 to 2.0 ml/g, preferably 0.35 to 0.75 ml/g, a
distribution of pore diameter of 4 to 1000 Å, preferably 5 to 500 Å.